EXECUTIVE SUMMARY

E.1 INTRODUCTION

This document evaluates the environmental consequences associated with granting and extending permits for proposed commercial dredging activities within the Allegheny River (between river miles 0 - 69.5) and Ohio River (between river miles 0-40) (defined as the study area, which includes adjacent terrestrial habitat) in the general vicinity of southwestern Pennsylvania. The study area encompasses a series of river pools created by a system of locks and dams maintained by the U.S. Army Corps of Engineers (USACE). Permits for commercial dredging activities within the study area are regulated by the USACE, Pittsburgh District and the Pennsylvania Department of Environmental Protection (PADEP). These permits allow for the extraction of sand and gravel from the river bottom at specified locations using a variety of procedures. The extracted material is processed for subsequent sale and distribution either on the river, using a floating processing plant, or at a fixed land based plant.

Dredging activities have taken place in the Allegheny River and Ohio River for over a century, providing needed sand and gravel, primarily from glacial deposits, for a wide variety of infrastructure projects throughout the region. In general, dredging activities have increased river-bottom relief through formation of pockets, troughs, and deeper areas. Much of the river bottom within the study area that is currently permitted for dredging has been dredged in the past. Current dredging activities have the potential to increase the river bottom depth by 15 to 35 feet relative to current depths, to a maximum water depth of about 50 feet. The current average water depth in all dredged areas is 30 feet within the entire study area. As a result of dredging, eight percent of the river bottom is 20 to 40 feet deep (approximately two-thirds of all dredged areas) and 2 percent of the river bottom is greater than 40 feet deep (approximately one-tenth of all dredged areas).

E.2 PURPOSE AND NEED

The commercial dredging companies seek extension of their existing permits from various agencies including: U.S. Army Corps of Engineers (USACE) dredging permits; the Pennsylvania Department of Environmental Protection (PADEP) Water Obstruction and Encroachment Permits; and the PADEP Sand and Gravel License Agreements. These permits may be issued, suspended, or modified pending completion of the NEPA process. The correct purpose described by these commercial sand and gravel companies, is the extraction of sand and gravel for commercial sale. These companies, referred to as the "Applicants" include: Hanson Aggregates PMA, Inc. (formerly Pioneer Mid-Atlantic, Inc. and Davison Sand & Gravel); Glacial Sand and Gravel Company; and Tri-State River Products. The underlying need for this action, as stated by the applicants, is to provide materials supporting diverse infrastructure and construction requirements to a wide variety of customers in the region.

In addition to the applicant's stated purpose and need, there are recognized societal needs for this product which must be met regardless of whether the permits are granted, extended or modified. The feasibility of meeting these needs through means other than dredging (e.g., land based operations, use of recycled materials, or importation of aggregate material from other locations) is evaluated in this environmental document.

The applicants seek to continue mineral extraction to ensure a continuous supply of relatively inexpensive, high quality aggregate used by their customers for highway building, construction, and maintenance; commercial and private construction; related infrastructure development; and other uses. Within the last ten years, the applicants have extracted between three and four million tons of sand and gravel material annually. Table E-1 presents a summary of material produced by the applicants in 1998. This material was sold and distributed to customers throughout western Pennsylvania, portions of northern West Virginia (primarily northern panhandle and Morgantown area) and eastern Ohio (primarily counties east of Interstate 77). Although, the customer base includes a relatively large geographic area, the majority of the material was used in southwestern Pennsylvania.

Table E-1
Tons of Sand and Gravel Produced by the Applicants, 1998

Material	Tons Produced
Sand (Type A)	1,500,000
Coarse Aggregate (SRL E)	680,000
Other Coarse Aggregate	1,900,000
Total Sand and Gravel	4,100,000

The applicants also supply distinct high quality aggregates that meet the rigorous anti-skid requirements specified by the Pennsylvania Department of Transportation (PennDOT). In 1998, the applicants produced and sold approximately 700,000 tons of Level E skid resistance level (SRL) coarse aggregate material, the highest rated skid resistance material identified by PennDOT. Only SRL E designated coarse aggregate material can be used on road surfaces with an average daily traffic of 20,000 or more vehicles.

E.3 SCOPE OF THE ENVIRONMENTAL DOCUMENT

This document was developed in accordance with:

- National Environmental Policy Act (NEPA)
- Implementing regulations issued by the President's Council on Environmental Quality (CEQ)
- Federal regulations for implementing NEPA for federal actions involving navigable waters under the jurisdiction of the Corps of Engineers as presented in 33 CFR Part 230 and 325

This Environmental Impact Statement (EIS) provides the District Engineer, U.S. Army Engineer District, Pittsburgh, with information regarding the environmental impacts to consider as part of the public interest review of the applications in accordance with Corps of Engineers regulations. The EIS also serves to provide information to other regulatory and commenting agencies and the general public about the likely environmental consequences of the proposed action and alternatives. The NEPA process ensures that the public has an opportunity to raise issues and concerns to the District Engineer.

An interdisciplinary team of environmental scientists, aquatic and terrestrial biologists, toxicologists, ecologists, geologists, planners, economists, engineers, and cultural resource specialists have analyzed the proposed action and other alternatives in light of existing conditions. The team has identified relevant beneficial and adverse effects associated with the action. This document analyzes both the direct effects (those caused by the action and occurring at the same time and place) and the indirect effects (those caused by the action and occurring later in time or farther removed in distance but still reasonably foreseeable), as well as the effects from secondary actions (reasonably foreseeable actions taken by others). The potential for cumulative effects is also addressed, and mitigation measures are identified where appropriate.

In reviewing the findings of this EIS it is important to note that over the past two hundred years, human activity has profoundly altered the characteristics of the Allegheny and Ohio Rivers within the study area. In addition to dredging, human activities which have altered these rivers include: agricultural development and deforestation, urbanization, mining, industrial waste discharges, canalization, and navigation. This report evaluates the environmental consequences associated with river dredging activities as the rivers currently exist rather than relative to virginal conditions (i.e., pre-colonial periods). In addition, the document addresses cumulative impacts associated with river dredging activities that have occurred in the past and present, and are predicted to occur in the foreseeable future.

E.4 ALTERNATIVES EXAMINED

This document evaluates four alternatives:

Alternative 1 is the complete cessation of commercial river dredging within the study area following expiration of existing permits held by the applicants and denial of permit extensions. This alternative would essentially place a moratorium on future commercial dredging activities (other than for navigational purposes) on the entire navigable Allegheny River and between river miles 0 to 40 on the Ohio River. This alternative, which is considered the “no action” alternative, evaluates the effects of cessation of river dredging relative to baseline conditions (i.e., current conditions) within the study area.

Denial of these permit extensions will ultimately result in the termination of business operations and the inability of the applicants to continue to meet the needs and contracts of customers who have routinely purchased sand and gravel materials. As a result, secondary

producers (i.e., concrete and asphalt production companies) throughout Pennsylvania, West Virginia, Maryland, and Ohio who currently purchase sand and gravel from the applicants, will be required to find alternative sources of material under this alternative. Alternative 4, discussed below, evaluates the effects associated with obtaining needed sand and gravel material from other sources within the region, such as land-based quarries and importation.

Alternative 2 consists of obtaining sand and gravel from the Allegheny and Ohio Rivers through commercial dredging as currently permitted. Alternative 2 allows for the granting and reissuance of Department of the Army Section 10 (33 U.S.C. 403) permits to commercial sand and gravel companies for the removal of sand and gravel between river miles 0 - 69.5 on the Allegheny River and between river miles 0 - 40 on the Ohio River. The companies seek reissuance of their existing permits from various agencies including: USACE dredging permits; the PADEP Water Obstruction and Encroachment Permits; and the PADEP Sand and Gravel License Agreements.

Under Alternative 2, the applicants would be required to conduct dredging activities in accordance with current permit conditions established by the permitting agencies. The permit conditions include requirements applicable to all activities within the study area (referred to as universal permit conditions).

Under existing permits, the applicants are granted site-specific permits to dredge within specified river miles on the Ohio or Allegheny Rivers. These site-specific permits identify permit conditions and mitigation requirements under which the applicants must operate. A summary of the primary permit conditions are presented below:

- *Islands and Shores.* No dredging is allowed within 150' of the 6' river depth contours, as measured at normal pool water elevation, or closer to the 6' river depth contour than twice the dredging depth (on average, this represents a 225' off-set from all shorelines). Buoys marking the 6' contour must be placed in the field adjacent to the dredging operation. No dredging is allowed on the backchannel side of any island, or within 1000' upstream and 300' downstream of any island.

- *Dams.* No dredging is allowed within 1000' of the upstream or downstream face of any navigable dam or lock.

- *Bridges and Piers.* No dredging is allowed within 500' of any bridge, pier, or abutment.

- *Navigation Channels.* No dredging is allowed within 150' of the centerline of the navigable channel unless authorized by USACE. There will be no unreasonable interference with the free discharge of the river or stream or navigation during dredging. If it is determined that water obstruction or encroachment causes unreasonable obstruction to the free passage of floodwaters or navigation, the licensee, upon

notification, will remove or alter the water obstruction or encroachment at their own expense.

- *Public Water Supply Intakes.* No dredging is allowed within 1000' upstream, downstream, or laterally of any public water supply intake. Permitting agencies may impose additional set-backs from public water supply intakes, if in the opinion of the permitting agency, it is necessary to protect the intake from impacts created by the nearby dredging operation. PADEP further reserves the right to establish a setback laterally or upstream of any industrial, commercial, or public surface water intake.

- *Public Water Supply Well.* No dredging within the capture zone of any public water supply well or well field is allowed.

- *Underwater Structures.* No dredging within 300' of submerged pipelines and/or submarine cables, and within 300' of active commercial or industrial docks, or public launching area.

- *Water Quality*. Weekly or bi-weekly sampling and analysis for total suspended solids, as per PADEP Water Quality Management Permits will be conducted. For on-board processing, USACE and PADEP require that discharge be delivered through a deep-water diffuser and conveyed to the dredge trench. Cranes must be positioned downstream and the wastewater diffuser positioned upstream. PADEP requires total suspended solids (TSS) water sampling at the river surface, at one-half the river depth and one foot from the bottom, at 100' upstream of the dredge; at 100', 500' and 1000' downstream of the dredge (at the same depths) and directly behind the dredge; and at 100' to the right and left (at the same depths), resulting in 30 water samples per sampling event (these locations may vary slightly for individual site-specific permits). PADEP requires that total suspended solids (TSS) levels at any sampling point 1000' downstream of the dredging unit cannot exceed 25 mg/L above TSS levels measured 100' upstream of the dredging unit. Bilge, ballast, or wash water pumped from barges will not be discharged to the river without removal of oil or toxic compounds. No refuse, sludge, oils, or petroleum products shall be discharged to the river. Use of non-toxic flocculants is required by PADEP for dredges with on-board processing.

- *River Bottom Substrate.* PADEP requires that all construction debris and excavated refuse incidental to the activity shall be removed from the stream and placed on shore above water influence, or at such dumping grounds as may be approved by PADEP (excluding incidental fall back). As specified by PADEP, dredged rock material that is larger than that which Licensee’s equipment can process may be returned to the river at the bottom of the trench from which it was dredged.

- *Threatened and Endangered Species and Habitat.* All dredging must cease and regulatory authorities notified, if fauna or flora on the Federal or State registers of listed species, or habitat critical to their survival are encountered. In accordance with the

Endangered Species Act (ESA), formal consultation with the USFWS will be required if dredging activities have the potential to harm either Federally-listed species or critical habitat.

- *Mussel Beds.* Prior to issuing site-specific permit authorization for dredging, the applicants must conduct mussel surveys in accordance with the currently approved mussel sampling protocol. Dredging will be prohibited (e.g., will not be authorized) if federally listed mussel species and/or significant mussel resources are found, based on the decision criteria established in the mussel sampling protocol. If federally listed mussel species and/or significant mussel resources are found, appropriate buffer restrictions are placed around the mussel resource. If federally listed mussel species and/or significant mussel resources are not found, the dredging company obtains a revised "Attachment" to the Water Obstruction and Encroachment Permit (via a permit amendment) from PADEP that specifies the "authorized areas" in spreadsheet form. The USACE will provide a letter stating that the Corps approves commercial dredging in that area.

- *Cultural Resources.* All dredging must cease and the Pennsylvania Bureau for Historic Preservation must be notified in the event that previously unidentified historical or archaeological sites are encountered.

Using the current permit conditions discussed above, an extensive analysis was conducted to identify areas that may be considered for future site-specific dredging permits under Alternative 2. Permit restriction data and bathymetry data collected by both agencies and the applicants were compiled to estimate the volume of mineable sand and gravel in each pool. The mineable reserves estimate for each pool were then used to estimate the potential life cycle of the industry. The theoretical maximum tonnage of sand and gravel material in all pools of the Allegheny and Ohio Rivers is 200 million tons (assuming a uniform depth of 50 feet and excluding areas with known permit restrictions). When considering the above permit restrictions, recoverable reserves were estimated to be between 88 and 118 million tons of sand and gravel.

Given current production rates and estimated recoverable reserves, commercial dredging could conceivably continue over the next 20 to 25 years under this alternative. Over the next 10 years, it is estimated that dredging would disturb approximately eight percent of the river bottom, approximately 80% of which would be previously dredged areas. In any one year, commercial sand and gravel dredging would occur over a much smaller area: between 0.3 to 3 percent of the river bottom annually (approximately 100 acres or 0.8 percent of the river bottom, annually).

Alternative 3 consists of several additional site-specific restrictions, in addition to current permit conditions outlined under Alternative 2, that are evaluated within an adaptive management process. Regulatory agencies, with input from resource organizations, would require additional restrictions as needed to avoid or minimize potential impacts in a given

location requested for dredging. Additional site-specific restrictions evaluated under Alternative 3 include, but may not be limited to the following special conditions:

- ***Limiting dredging to certain areas.*** Through consultation with the USFWS regarding the protection of federally endangered mussel species, it may be determined that dredging needs to be restricted in portions and/or entire pools of the Allegheny River.
- ***Additional site-specific analyses or surveys prior to dredging.*** Through consultation with USFWS regarding the protection of endangered mussel species and/or sensitive habitat, it may be necessary to develop enhanced protocols and/or site-specific analyses to ensure protection of listed species through an adaptive management process.
- ***Altering the bathymetry or configuration of dredged areas.*** As discussed further in Section 4, altering the 3 dimensional configuration of a dredged hole can significantly change the flushing rate and circulation within the hole, thereby, altering the dissolved oxygen (DO) levels. Due to the nature of the permitting process, dredged areas can resemble deep isolated pockets with abrupt changes in river bottom contours that can reduce flushing rates within the hole. As a result of added cumulative effects (e.g., nearby thermal discharges, drought conditions, or other site-specific conditions), future dredging may create additional holes that experience periodic levels of DO below state standards. In areas where deep isolated pockets already exist, approving additional dredging in these areas may increase the size of the dredged hole (i.e., creating a channel, rather than isolated deep pockets), thereby increasing flushing rates and DO levels. In addition, modifying the slope of the dredged hole can also enhance flushing.
- ***Restricting dredging in certain habitat conditions.*** Through an interagency adaptive management process, it may be appropriate to restrict dredging in certain habitats deemed important to the propagation of aquatic life and/or conservation of sensitive or listed species, although these habitats have not yet been defined.
- ***Restricting initial dredging to certain minimum depths.*** Restricting initial dredging in shallow areas (e.g., less than 9 feet deep) at the point of excavation, may conserve habitat important for certain aquatic life.
- ***Additional measures to mitigate noise conflicts/complaints.*** Under certain conditions, noise levels from dredging units may cause conflicts with nearby land use, particularly in cases where sensitive dwellings (e.g., residents, schools, churches, medical facilities, nursing homes) are in close proximity to the river. Noise monitoring at nearby residential homes and/or other dwellings may be necessary to ensure that excessive noise levels do not occur. In the event of noise complaints, several site-specific mitigation measures can be applied including: moving the dredging unit, reorienting the dredging unit so that the "quieter side" is facing the sensitive area, limiting night-time operations, enhanced dredge sound proofing and engineering controls, and/or noise monitoring.
- ***Additional compensatory mitigation and/or restoration measures.*** Dependent on individual and cumulative project impacts, mitigation and/or restoration measures may be required to minimize or offset adverse environmental impacts. Such measures may be designed and developed through the adaptive management process and include such things as channel restoration, embayments, riparian improvements, wetland creation, etc.

Extensive GIS analyses were used to estimate reserves based on different types of additional restrictions and thereby, evaluate the likely socioeconomic consequences. Based on current

knowledge of the industry, commercial dredging generally extracts a certain tonnage of aggregate material each year to maintain a backlog of needed supply. Therefore, additional restrictions that decrease the reserves available for dredging will likely result in a decrease in the industry's life cycle as opposed to a decrease in production in the short-term; i.e., the industry may extract the tonnage per year they do currently but reserves will not last as long. Once reserves are depleted, dredging will not be viable in its current state and a situation similar to Alternative 1 will result. Under Alternative 3, the life cycle of the industry may be expected to last 10 to 15 years depending on how the additional permit conditions are applied.

Alternative 4 consists of using land-based operations, recycled materials, or importation of sand and gravel from other locations to meet the regional need for this material. This alternative includes the complete cessation of commercial river dredging (other than for navigational purposes) and denial to extend existing permits held by the applicants. Alternative 4 evaluates the short-term and long-term, direct and indirect effects, associated with obtaining sand and gravel from land-based quarries and other sources within the region. Implicit in this alternative is the practicality of relying on sources other than dredging within the study area, and the degree to which these other sources can satisfy the demand for sand and gravel. It is important to recognize that the need for sand and gravel sources in the region (or anywhere else) is market-driven; i.e., those sources that consistently provide the necessary volume of appropriate quality material at the least cost will have the majority of the market share. Because aggregate material such as sand and gravel is heavy and bulky, most of the cost is in transporting the material to the job site or distributor. Aggregate will reach the Pittsburgh region from a variety of sources if the price is worth the extraction and shipment costs.

Alternative 4 is effectively the result of selecting the No-Action alternative (Alternative 1). This alternative is not the Federal Action being evaluated but is rather an outcome of a decision regarding commercial dredging permits, and is not within the regulatory authority of the Corps to select or implement such an alternative. It is the market forces that occur as a result of denying or restricting permits under Alternatives 1 or 3, respectively, that will define what other sources, or blend of sources, will provide aggregate material to the Pittsburgh region. Therefore, this document does not analyze specific combinations of sources. Instead, we estimate the tonnage of various aggregate types produced by other existing sources and their approximate cost, and analyze the extent to which such sources could increase their production in the future.

Recycled aggregate materials were also evaluated as a potential substitute for river dredged aggregate material. Specifically, recycled glass (RG) and recycled Portland Cement Concrete (RPCC) were assessed for their potential use in highway and building construction. Information provided by PennDOT (PennDOT, 2003) suggested that these materials would not meet their specifications and could not be used in highway construction. The quality of the recycled material may also not be suitable for most building construction products. Furthermore, there are no major recyclers in the Pittsburgh area, hence, the materials would

have to be transported over long distances, rendering this option uneconomical, even if specifications could be met.

With respect to other dredging sources, a search was conducted to identify other sources of Type A sand and SRL E aggregate that may be imported into the Pittsburgh metropolitan area. Other sources were identified that may barge material to Erie, Pennsylvania (then trucked to Pittsburgh) or barge material to Pittsburgh from the lower portions of the Ohio River (as far away as Kentucky). A market analysis was performed to determine what types of aggregate products could be barged cost-effectively into Pittsburgh. Importation of dredged material will also be subject to similar environmental impacts as dredging within the study area.

In the short term, existing sources of sand and gravel would be utilized to meet the shortfall in current river-based production. The results of detailed market analysis indicate that there is enough production capacity from land-based quarries within the region to meet the demand for sand and gravel products in the region (i.e., in the absence of river-based sources) provided production rates are increased. In the long-term, market forces would lead to the development of new land-based quarries within western Pennsylvania.

In the short-term, it is estimated that approximately 50 existing quarries would need to increase production by 30 percent in order to make up for the immediate loss of three-four million tons annually of river-based aggregate. It appears in the long-term, that land-based sand and gravel resources of Pennsylvania could be developed to supply the needs of the applicant's customers, so long as environmental permits are issued and local land use approvals are obtained for the expansion and/or creation of new quarries in the region. It is estimated that about 20 new local quarries would be needed to offset the demand for sand and gravel products in the market. Due to the capital investment required and public opposition to new land-based operations, it is uncertain whether the existing 50 quarries would increase production or whether new quarries would be added. However for the purpose of evaluating this alternative, the assumption is made that quarries would be expanded or created.

E.5 ENVIRONMENTAL AND SOCIOECONOMIC EFFECTS OF THE ALTERNATIVES

A summary of the environmental and socioeconomic effects of Alternatives 1, 2, 3, and 4 are presented in Section 4.0, Table 4-9. Overall, significant adverse effects on hydrology, water quality, and rare mussels (i.e., rare, threatened, and endangered species) were associated with Alternative 2. Similar impacts are associated with importation of aggregate via dredging from sources downstream of the study area. Several adaptive management measures identified in Alternative 3, should reduce these effects as detailed in the environmental document, including more intensive mussel sampling prior to approval to dredge an area, restricting river segments ≤ 9 feet deep from future dredging, restricting dredging near unique habitats, and modifying dredged trench morphology to enhance flushing and optimize dissolved oxygen. Significant adverse effects on public safety, including child protection,

were identified for Alternative 1 and Alternative 4 (as a result of induced effects associated with increased land-based quarry operations). These consequences may be reduced if new land-based quarries are constructed near customers in the long-term (thereby increasing traffic safety), as well as requiring additional reclamation of quarries to reduce long-term public safety hazards. Negligible, minor, or moderate effects were identified for the remaining resource areas for each of the alternatives. In addition to these effects, several cumulative adverse effects were identified, including adverse impacts to hydrology (approximately eight percent of the river bottom will be irreversibly disturbed over the next 10 years through the creation of trenches in both Alternatives 2 and 3), and potential future impacts on dissolved oxygen levels, mussels, and fish due to past, present, and foreseeable future actions within the watersheds of these river systems under Alternative 2. Fewer future cumulative impacts are projected under Alternative 3. Other actions which have resulted in major impacts to the river systems include:

- Lock and dam system and other man-made modifications to the river (e.g., navigation dredging, civil works projects) have contributed to further hydrologic modifications, sedimentation, and anoxia;

- Industrial and municipal facilities have contributed to BOD, toxics, nutrient loadings, and pathogens; and

- Agricultural and urban runoff has contributed to BOD, toxics, sedimentation, and pathogens.

E.6 PREFERRED ALTERNATIVE

The selected alternative is Alternative 3. This alternative, as described in the Final EIS, provides for the issuance of new Department of the Army permits to the applicants with added restrictions (in addition to the current permit conditions) and initiation of an adaptive management process, which will further assist in avoiding or mitigating identified or potential adverse environmental impacts associated with the dredging. In reference to sand and gravel dredging, an adaptive management process is defined as an ongoing effort to develop improved and scientifically valid permit conditions or restrictions that are required to enhance protection of aquatic and associated littoral and terrestrial biota and habitat. Such biota include Federally-designated endangered and threatened species and Candidate species. This process relies on regular inter-agency coordination between the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), Pennsylvania Department of Environmental Protection (PADEP), Pennsylvania Fish and Boat Commission (PFBC), and the dredging industry in a proactive and candid manner. Such coordination can be initiated by any of the above agencies, which are the key stakeholders for commercial sand and gravel dredging in Pennsylvania.

This alternative serves to minimize the overall adverse impacts while allowing for continued commercial sand and gravel dredging operations.